

Rec'd P PTO 28 APR 2005

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization

International Bureau



(43) International Publication Date 13 May 2004 (13.05.2004)

PCT

(10) International Publication Number WO 2004/040697 A1

(51) International Patent Classification7: 9/26, 1/24

H01Q 7/00,

(21) International Application Number:

PCT/EP2003/011532

(22) International Filing Date: 17 October 2003 (17.10.2003)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

02024241.8

EP 31 October 2002 (31.10.2002) US

7 November 2002 (07.11.2002) 60/424,400

- (71) Applicant (for all designated States except US): SONY ERICSSON MOBILE COMMUNICATIONS AB [SE/SE]; S-221 88 Lund (SE).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): ROSENBERG, Hans [NL/NL]; Hanzekamp 11, NL-7991 ED Dwingeloo (NL). JIDHAGE, Henrik [SE/SE]; Tallasvägen 13, S-411 60 Alingsas (SE). SVENSSON, Bengt [SE/SE]; Muraregatan 10, S-431 66 Mölndal (SE).

- (74) Agent: DAHNÉR, Christer; Ström & Gulliksson IP AB, P.O. Box 7086, S-103 87 Stockholm (SE).
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declaration under Rule 4.17:

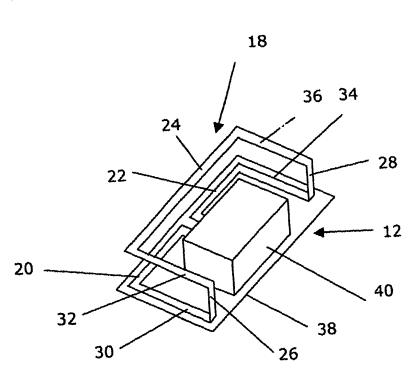
of inventorship (Rule 4.17(iv)) for US only

Published:

with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: WIDEBAND LOOP ANTENNA



(57) Abstract: The present invention relates to a wireless communication device and an antenna arrangement in such a device, where a loop antenna element (18) comprises: a first section (20) provided in and extending a length in a first plane, a second section (22) spaced from, provided in and extending a length in the first plane, a third section (24) in a second plane parallel to the first plane, aligned with the first and second sections, and a fourth (26) and a fifth section (28) interconnecting antenna sections in the first and second planes. The sections form a three-dimensional structure having a substantial two-dimensional extension in at least one of the first and second planes. The second section extends along the same line as the first section or has a curvature, which is a continuation of the curvature of the first section. Thereby a small wideband antenna requiring a small ground plane is obtained.



Internation Application No PCT/EP 03/11532

A. CLASSIFICATION OF SUBJECT MATTER IPC 7 H01Q7/00 H01Q9/26 H01Q1/24 According to International Patent Classification (IPC) or to both national classification and IPC B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) IPC 7 H01Q Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Electronic data base consulted during the international search (name of data base and, where practical, search terms used) EPO-Internal, PAJ, WPI Data, INSPEC C. DOCUMENTS CONSIDERED TO BE RELEVANT Category ° Citation of document, with indication, where appropriate, of the relevant passages Relevant to claim No. X US 2002/018021 A1 (MORISHITA HISASHI ET 1 - 18AL) 14 February 2002 (2002-02-14) the whole document GB 692 692 A (CHARLES ALEXANDER VIVIAN X 1,3-9, HEATH) 10 June 1953 (1953-06-10) 13,16 page 11, line 32 - line 57; figure 39 WO 02/27862 A (RANGESTAR WIRELESS INC) 1.2. Α 4 April 2002 (2002-04-04) 16-18 page 13, line 1 - line 21 page 14, line 20 - line 23; figures 20,23 Α US 6 225 952 B1 (HARANO NOBUYA) 1,16 1 May 2001 (2001-05-01) the whole document Further documents are listed in the continuation of box C. Χ Patent family members are listed in annex. Special categories of cited documents: T later document published after the International filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention 'A' document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such docu-*O* document referring to an oral disclosure, use, exhibition or ments, such combination being obvious to a person skilled document published prior to the international filing date but later than the priority date claimed "&" document member of the same patent family Date of the actual completion of the international search Date of malling of the international search report 3 February 2004 09/02/2004 Name and mailing address of the ISA Authorized officer European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo ni,
Fax: (+31-70) 340-3016 Moumen, A



PCT/EP 03/11532

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
US 2002018021	A1	14-02-2002	JP CN GB	2002043826 A 1335654 A 2366916 A	08-02-2002 13-02-2002 20-03-2002
GB 692692	Α	10-06-1953	NONE		
WO 0227862	A	04-04-2002	US EP WO	2002158803 A1 1330852 A1 0227862 A1	31-10-2002 30-07-2003 04-04-2002
US 6225952	B1	01-05-2001	JP CN KR	11355021 A 1240305 A 2000006092 A	24-12-1999 B 05-01-2000 25-01-2000